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Stefano Saj, Carla Galeazzi

Michele Betti, Francesco Faccini, Paolo Madonia





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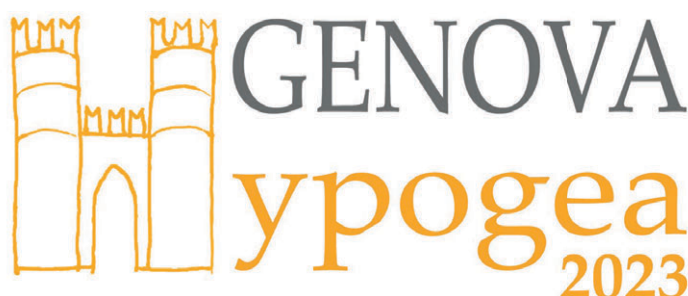


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Underground Shelters in Cappadocia (Turkey)

Roberto Bixio^{1,*}, Ali Yamaç²

Abstract

Structures carved in the rock for purposes of war or refuge are known all over the world and in every age. Cappadocia, in the middle of Turkey, is one of the places where such structures are most widespread and articulated, facilitated by very favourable geological and morphological conditions. The historical events that may have pushed the populations resident in this territory to dig this type of structures are numerous and distributed over a very large period of time. However, in view of a compelling set of clues listed here, the period that most justifies the expansion of a system of underground shelters is that of the Arab raids that afflicted the Byzantine territory between the middle of the 7th and early 11th centuries AD. The organization of all the shelters in Cappadocia seems to comply with a common design, then varied according to local needs. Each project includes a basic unit consisting of a residential or utilitarian part, and a composite set of devices for the defence of a more internal area in which are preponderant heavy stone doors in the shape of a millstone. The set of units can form well organized systems, which sometimes extend even for kilometres, corresponding to surface villages, or integrated in ancient rock-cut dwellings. Currently, these structures are locally called “underground cities”, regardless of their size and their actual function, but it would be appropriate to identify them as “underground shelters”, or more generically as “underground settlements”.

Keywords: *Cappadocia, underground shelter, underground settlement, underground city, yeraltı şehri.*

Introduction

It is well known that people have used, and still use underground spaces everywhere, for thousands of years, not only as dwellings where to take cover from the adverse weather conditions, or worship reasons, but also to hide and defend themselves from hostile actions. The entrances to these shelters, dug into the rocky outcrops and underground, are almost always not easy to locate. Rooms of various sizes, connected by tunnels usually equipped with traps and doors, almost impossible to open from the outside, have turned these structures into defence centres, indispensable against all kinds of hostile events throughout history. Therefore, in many geographical areas, from Vietnam to France, there are today evidence of countless underground structures of this type (Triolet and Triolet, 1996; 2013).

However, the first place that comes to mind is, in all likelihood, Cappadocia, located in the core of Anatolia (figs. 1, 2), consisting mainly of soft volcanic rocks, cliffs, canyons, badlands and eroded pinnacles. The two main reasons for this appeal are the huge number and density of underground settlements on this territory and the remarkable size and complex organization of some of them. Small or large, almost every village in Cappadocia has rock-cut or underground artificial structures of several types, including one or more equipped also for defence (shelters) (fig. 3). They are particularly concentrated in the provinces of Nevşehir, Kayseri and Aksaray, but are also present in the other neighbouring provinces (figs. 2, 4).

We can note that on the rock-cut churches there is a very vast literature. Instead, investigations on man-made structures in the rock formations of the region that specifically concern the so-called “underground cities” or, better, “underground shelters”, begins only in the 1970s. The first study on this subject belongs to Martin Urban (1973a-b-c), followed by works of Yörükoğlu *et al.* (1989), the Triolet brothers (1993), and two officials of the Nevşehir Archaeological Museum (Gülyaz and Yenipınar, 1995).

In 1991 a multi-year project started to systematically explore and map as many underground settlements as possible. The program was developed by researchers from Centro Studi Sotterranei (CSS) of Genoa (Italy), partner of National Artificial Cavity Commission, which is an organisation of the Italian Speleological Society. The investigations were carried out with the authorization of the Turkish Ministry of Culture (Bertucci, Bixio, and Traverso, 1995; Bixio, Castellani and Succiarelli, 2002; Bixio, 2012). More recently, a systematic research project promoted by Kayseri Province and led by Obruk Mağara Araştırma Grubu (O'MAG) of Istanbul has started.

At the same time a data collection and a cataloguing was carried out both on the sites explored and on those whose sources could be found. The two most complete inventories achieved so far are: “Cappadocia: Records of the Underground Sites” (Bixio, 2012), and “The Archaeological Settlements of Turkey” (Akyürek *et al.*, 2015). Although more than 120 rock-cut and underground settlements are recorded in these two inventories, documentation and maps of only a small part of

¹ C.S.S. - Centro Studi Sotterranei, Genoa (Italy)

² O'MAG - Obruk Mağara Araştırma Grubu, Istanbul (Turkey)

* Reference author: Roberto Bixio - roberto.bixio@gmail.com

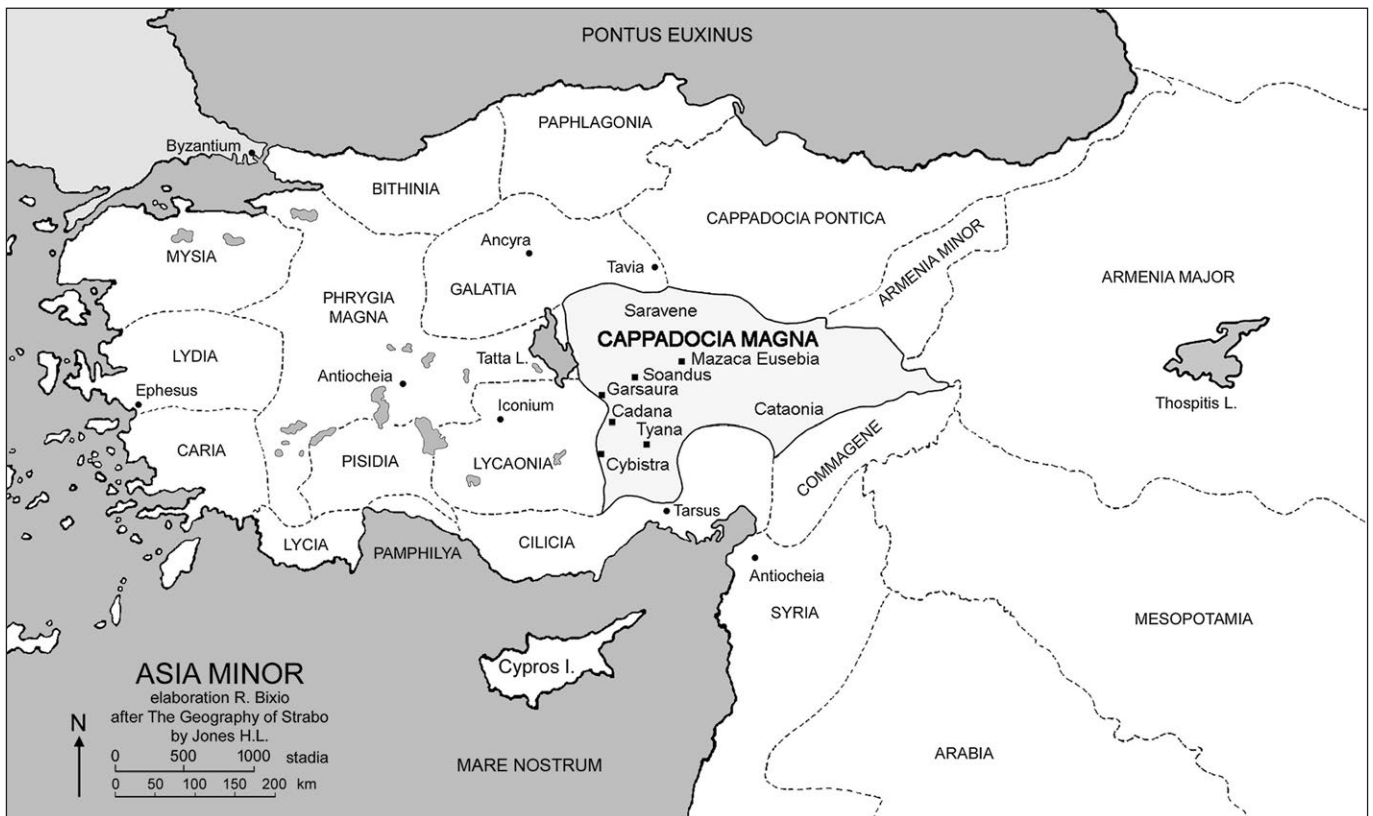


Fig. 1 – Cappadocia at the time of Strabo, about AD 14 (drawing modified by R. Bixio, after Jones, 1954).

these structures are available. However, thanks to the O'MAG and CSS teams, new and wider investigations are currently underway, with the result, among others, of having already updated the inventory, which will be soon published, geo-locating in total 364 sites with artificial cavities (fig. 4). Of these, at least 200 are structured with defence devices that allow us to identify them as real shelters.

Historical background

Cappadocia, from the second millennium BC, after being the centre of the Hittite Empire, with its capital Hattusa to the north (fig. 2), and then of the Neo-Hittite kingdom of Tabal (9th-8th centuries BC), later fell under the control of the Phrygian kingdom (8th-7th centuries BC). There were several Assyrian attacks in Cappadocia, in 718 BC and in the following years. Following the destruction of the Assyrian kingdom by the combined powers of Babylonians, Scythians, and Medes (612 BC), the latter and the kingdom of Lydia, in 590-585 BC, began another conflict in Cappadocia (Sevin, 1998). Later the region became a Persian satrapy: the name *Katpat.uk-a* first appears in 520 BC in an inscription by Darius reported by Herodotus (Kent, 1953: 107), but probably already mentioned as *Katta-peda* (Lower Land) in Hittite sources (Yakubovich, 2014).

Later the region became Hellenized during the conquests of Alexander the Great (322 BC), and then in

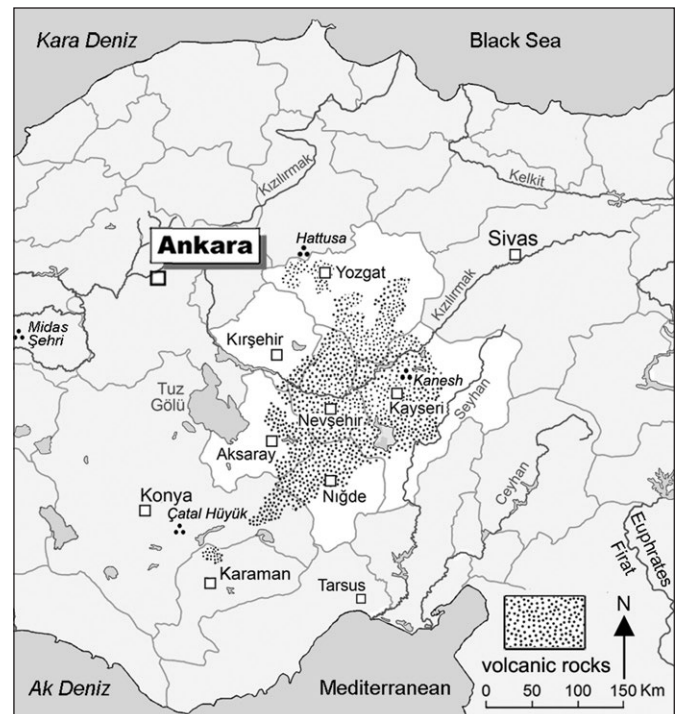


Fig. 2 – Central Anatolian Plateau. The current six provinces that we consider largely corresponding to historical Cappadocia. The dotted area corresponds roughly to the extent of the volcanic rock deposits, of about 20,000 square kilometres, where the investigations of underground settlements are still in progress (drawing R. Bixio).



Fig. 3 – Bürüngüz underground settlement (Kayseri Province). The network of tunnels and rooms is carved into the rock below the masonry village of surface. The part explored so far extends for 1286 m, defended by 27 millstone-doors. It is thought that the structure is much larger, extending under the whole masonry village, with more entrances and defence devices (photo A.E. Keskin).

the sphere of influence of Rome (about 190 BC); finally, in AD 17, it becomes a Roman province (fig.1) (Thierry, 2002: 25). The early rooting of Christianity occurs here immediately in the following period. In the second century Caesarea (before Mazaca Eusebia and now Kayseri), is already stabilized as a bishopric, despite the subsequent persecution of Valerian and Diocletian in the third century (Thierry, 2002: 62). At the beginning of the 4th century, the Emperor Constantine officially recognized the new religion, which expanded quickly, as witnessed by the construction of masonry churches and the excavation of countless churches in the rock, especially from the late 5th until the 13th century (Ousterhout, 2017: 5/13). In AD 314 Cappadocia was the largest province of the Roman Empire (Ramsay, 1890). This territory corresponds to almost six provinces of today (fig. 2), with a total area of at least 58,000 sq km, which includes over 20,000 sq km of volcanic deposits (dotted area) where nearly all the rock-cut and underground sites are located (fig. 4). From the beginning of the 7th century, Cappadocia was a frontier land of the Byzantine Empire threatened by the armies of the Sassanid Persian Empire. During the occupation of Caesarea by the Persians in AD 611, the residents fled and the city was destroyed. Afterward, in 622 and 627, the Byzantine Emperor Herakleios, campaigned against

the Persians in Anatolia, winning a string of battles. Between 628 and 632, a civil war greatly weakened the Sassanid Empire. The Arab armies took advantage of this situation and began to attack Anatolia. Rather than an invasion of the region, the Arab attacks consisted of a sort of “looting” that was repeated almost every summer and these raids continued for about 350 years (Mc Geer, 1991: 132-133).

A century after the end of the Arab attacks, the region was faced with the Seljuk Turks' raids. Their armies destroyed Melitene (today Malatya) in AD 1057 and Sebasteia (today Sivas) in 1059. In 1067 they conquered Caesarea (Runciman 1997: 54), burned it and massacred all the people. Four years later, in 1071, the Byzantine emperor Romanos IV arrived in the region with a large army to regain control of Cappadocia. After his defeat at the Battle of Mantzikert, the entire region was completely occupied by the Seljuk (Ash, 2006; Hild and Restle, 1981).

Dating the Cappadocian underground shelters

Generally, it is considered that all these underground shelters located in Cappadocia were dug by the local

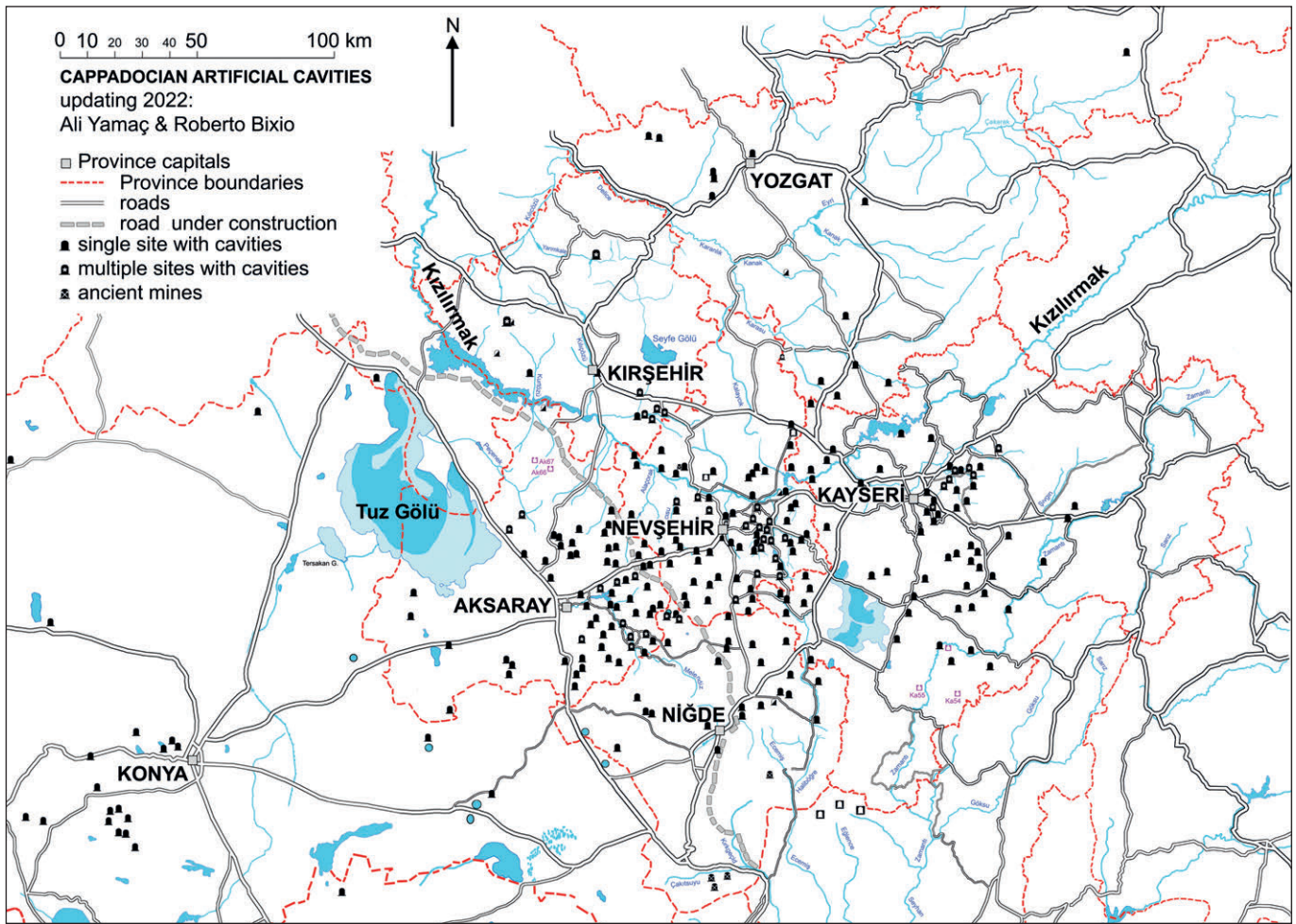


Fig. 4 – Updated 2022 map of all anthropogenic sites identified in the current six provinces of historical Cappadocia (drawing A. Yamaç and R. Bixio).

Christian population to defend themselves and survive in this troubled environment, between middle 7th and early 11th centuries, coinciding with the Arab raids. This opinion is supported by various researchers (Jerphanion, 1925; Kempe, 1988; Triolet and Triolet, 1993, 2002; Ousterhout, 2017).

Indeed, we note that on the rocky walls of many underground settlements there are often engraved crosses and in several cases they are associated with churches. Moreover, we know that during the archaeological excavations of the underground shelters at Aydın-tepe (Kayseri province), Kavlaktepe (Niğde province) and Oymalı (Konya province), exclusively fragments of Byzantine pottery were found (Faydalı, 1992, 1993; Özkurucuklu, 1992; Şahin, 1993; Erkmén, 1999; Bilici, 2003). In some cases, such as in the sites we investigated in Ağırnas and St. Mercurius (Kayseri province), the churches were carved right at the entrance of the underground settlements and the tunnels that extend from there are protected by millstone-doors. Therefore, the churches, used in normal times for religious functions, during the raids allowed people to hide and defend themselves in the inner part (Yamaç, Tok,

and Filikci, 2014; Yamaç, 2017). However, other clues suggest the possibility of their use both in previous centuries and in later times, but without invalidate this hypothesis.

Martin Urban proposes the hypothesis that Cappadocia, in the 8th and 7th centuries BC, could be considered a “buffer-zone” between the Phrygian and Assyrian kingdoms, thousand years before the Arab attacks (Urban, 1973c: 180-181). On this topic we point out that, although Urbans’ arguments seem to be plausible and may be worthy of further consideration, actually definitive archaeological and textual evidence has not yet been found.

The fact then that, in at least three cases, in the close vicinity of some underground shelters (Topada, Karaburna and Sivasa) there are rock hieroglyphics inscriptions attributable to the Neo-Hittite kingdom of Tabal, and near the underground shelter of Filiktepe the remains of a walled city are being excavated, leads not to discarded the possibility, originally, of some sort of very ancient relationship. However, even in this case, no direct link has so far been established between them (Mora *et al.*, 2017; 2020).

Structural features of underground shelters

Let's see, in summary, what are the elements that define the underground shelters of Cappadocia. In figure 5 we have schematically represented the basic

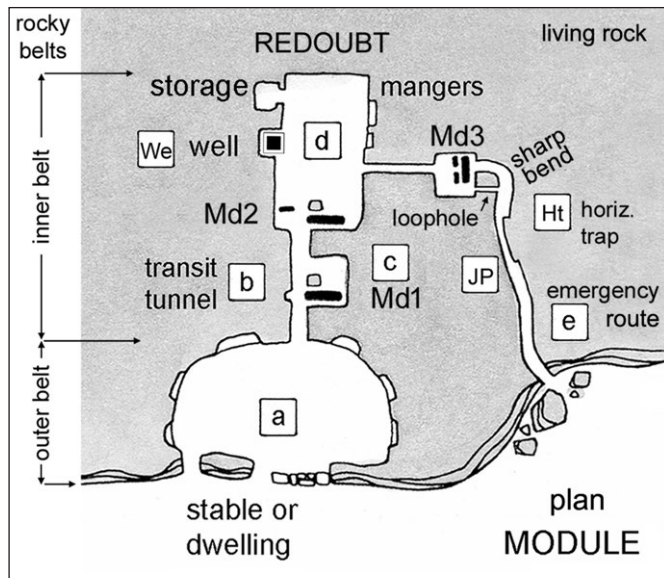


Fig. 5 – Schematic module of an underground horizontal unit consisting of dwelling and redoubt (drawing R. Bixio).

unit (module) that can be considered a structure intended for defence. It consists of a cavity [a] excavated in a rocky outcrop in the part closest to the surface, and used as storage, stable or even dwelling, or to serve a contiguous masonry house built outside. From the cavity [a] a corridor, protected by millstones (figs. 3, 9), leads to an internal compartment [d] (“redoubt”: term borrowed from military architecture). Almost always there is a small tunnel [e], also protected, used as an escape route or to surprise enemies behind. Stone doors [Md] were then normally supplemented by other passive and active defence devices (Bixio and De Pascale, 2015).

The modules could be replicated and interconnected to form networks (systems - fig. 6), with even kilometrical extensions, with mutual defence. More in-depth investigation of some of them revealed, that their configuration followed a predetermined design that provided for the establishment of “isolating rooms” that could block the aggressors from whatever direction they came, and of “isolated rooms”, or “redoubts”, in which the defenders could retreat, reorganising the defence, and receive or give help to other sectors.

The location of the underground shelters, their extension and their relationship with the ancient settlements are very varied according to the needs and dimensions of each local community and the morphology of the places. Recall that in Cappadocia highland

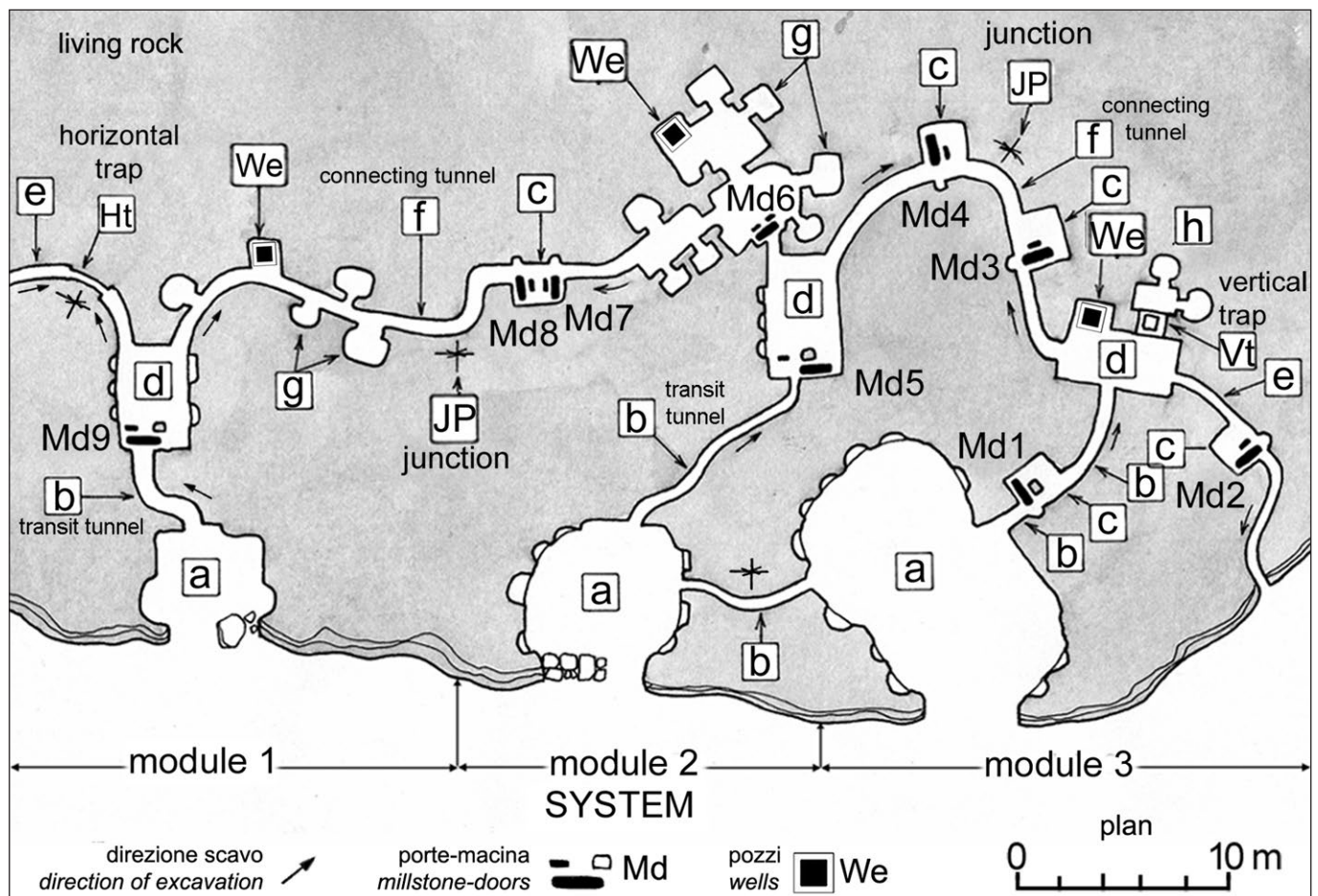


Fig. 6 – Schematic plan of a horizontal underground shelter. The system consists of several interconnected modules. For example, the Filiktepe system, consisting of about 20 modules, is 1673 m long, defended by 55 millstone-doors (drawing R. Bixio).

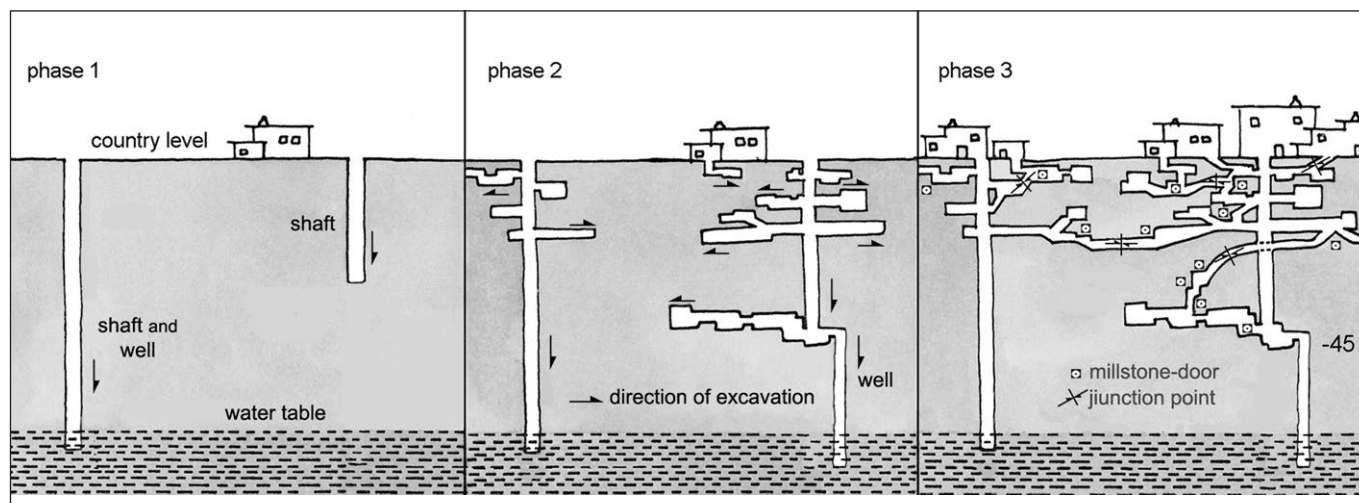


Fig. 7 – Diagram of the probable phases of radial excavation for the underground city and shelter of Derinkuyu: 1) excavation of shafts to extract the resulting material and for ventilation; 2) independent radial excavations conducted by each shaft to obtain rooms and tunnels on overlapping levels and wells to reach the aquifer; 3) connecting the rooms of different sectors and positioning of defensive devices (drawing R. Bixio).

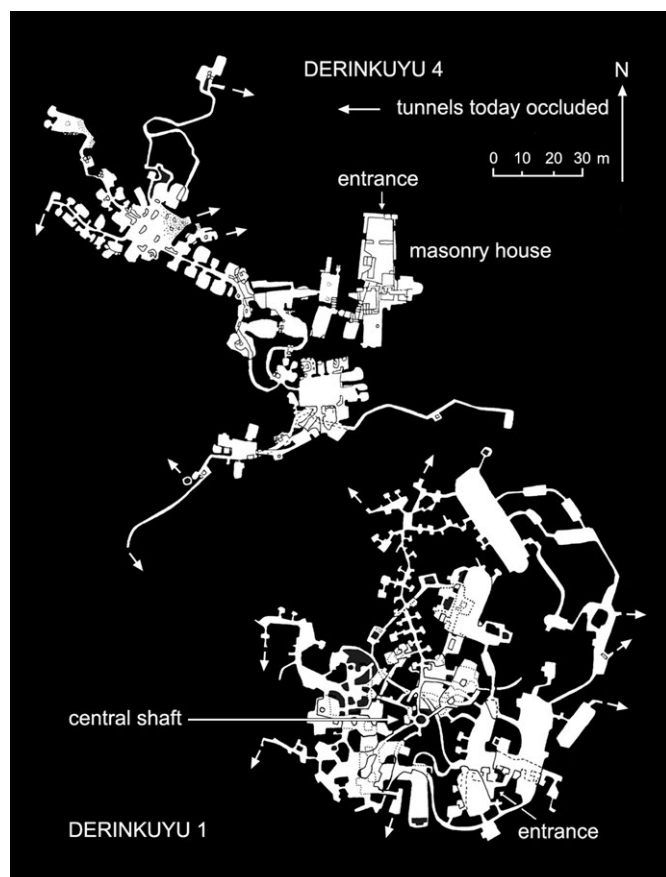


Fig. 8 – Schematic plans of two of the sectors, contiguous but not currently connected, of the underground city and shelter of Derinkuyu (elaboration R. Bixio).

areas scattered with flat free-standing hills (buttes) alternate with volcanic cones, cliffs, ravines, gullies and pinnacles. Networks of tunnels dug in isolated buttes, without external dwellings, have been identi-

fied, but also complexes within rock elevations contiguous to surface villages have been documented.

The most striking case is that of Derinkuyu. The underground network develops below the modern city to at least five overlapping levels; these reach a depth of about 45 m. The settlement is divided into sectors that we can consider “blocks”, with radial development (figs. 7, 8) that, today mostly inaccessible, are located under the masonry houses. All sectors are strongly defended, at various levels, by devices mainly consisting of a series of millstone-doors; these are more present in the tunnels leading to the lower floors, probably used as last defence (redoubt). The floors closest to the surface, instead, had, and in some cases still have utilitarian use to serve the dwellings above (Bixio, 2012; Yamaç and Tok, 2015).

Naming the underground shelters

Locally, the type of settlement described so far is improperly named “underground city”, in any case without distinction on the intended use or size. This term, in conformity with local custom, have been widely adopted by ourselves (Bixio, Castellani and Succhiarelli, 2002) and by every person who approaches the extraordinary rock-cut manifestations of Cappadocia, also because, actually, it is particularly evocative providing an immediate and suggestive image of its peculiar settlements (see, for example: Yörükoğlu *et al.*, 1989; Triolet and Triolet, 1993; Ayhan, 2004; Gülyaz and Yenipinar, 2007). Nevertheless, Ousterhout, on the subject points out that “the so-called underground cities remain one of the great enigmas of the region, subject to wild speculation” and it is more likely to consider them a kind of “redoubt system” integrated with more extensive underground residences or “a system of underground shelters [...] combined with a village on the surface” (Ousterhout, 2017: 12/345-



Fig. 9 – Kuşcağız underground shelter (Kayseri Province). Millstone-door currently in open position. In case of attack it was rolled in the appropriate groove, visible in the opposite wall, to close and defend the tunnel (photo A.E. Keskin).

346). Even the Triolet brothers (2022; 265-266), more recently they define them “*un ensemble exceptionnel de gigantesques souterrains-refuges villageois*”, that is, “rural underground-shelters” comparable to those of northern France.

Indeed, only in a limited number of cases it is possible to recognise a conformation that can be considered a real urban organisation which, however, even in the most complex and extensive sites can make you think of a quarter or, at most, a - more or less large - village, but not a city. We believe that only two of these settlements (Derinkuyu and perhaps Kaymaklı) actually have the size and organization of real underground “urban” centres, although they are currently only partly explored and documented and have been reworked to make them accessible to the public. In particular, the “underground city” of Derinkuyu is crossed by an underground “road network” that, in the only two sectors for now better documented (fig. 8), has an extension of over 2.5 km, but the total development is certainly much greater.

Conclusions

In short, while respecting the local terminology of “*yeraltı şehri*”, we will call “**underground shelters**” the structures that present an articulated and integrated defensive organisation (fig. 6). We will instead use the term “redoubt” in case of units, of limited size (fig. 5), having the function of “**last refuge**” within a larger defensive system, or in the case of single protected areas within predominantly residential (*konak* - fig. 10) or monastic (*manastır*) rock-cut complexes. In the event that the type of structure does not have obvious defensive characteristics, or is not clearly determinable, or present mixed elements, we propose the more generic name of “**underground settlement**” or “**rock-cut settlement**” (depending on the location) instead of “**underground city**”, a denomination perhaps more evocative, but less appropriate. In addition to this basic distinction, as we have seen, the panorama of the types is quite varied in location and conformation of each underground structure as a result of the lithological and morphological characteristics of each locality and the specific needs of each community. However, the general organization of all the structures and their defensive elements seems to comply with a common and coherent design throughout Cappadocian territory.

As for the dating of shelters, most opinions seem to agree that the time of the Arab raids between the 7th century and the end of the 10th / early 11th centuries is plausible, without excluding the possibility, at least in part, of other periods, prior or subsequent.



Fig. 10 – Rock-cut settlement of Büyük Kale or Konak, close to Gülşehir (Nevşehir Province). It is a real village carved on several levels into the cliff that continues into the canyon behind. It is integrated by an underground shelter, equipped with millstone-doors, a horizontal trap and wells, that extends for 183 m in the innermost body of the rock, parallel to the face (photo R. Bixio).

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